

Linzer biol. Beitr.	36/1	5-10	26.3.2004
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Two New Taxa of the *Crocus biflorus* Aggregate (Liliiflorae, Iridaceae) from Turkey

Preprint published 26.3.2004

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Abstract: Two new subspecies of *Crocus biflorus* MILLER from western Turkey are described.

Key words: *Crocus biflorus*, subspecies *caricus*, subspecies *ionopharynx*, Turkey, Caria.

Introduction

Travelling in the Lycian and Pisidian Taurus region in the late 1990s and early 2000s we found populations of *Crocus biflorus* which did not fit into the hitherto known classification (MATHEW 1982). We decided to perform extensive field studies of *Crocus biflorus* populations all over south-west Anatolia. Our aim was to investigate the complex situation regarding the distribution pattern in this area as well as morphological variation within and among populations. On various mountains we discovered *Crocus biflorus* populations not known before. These populations have been difficult or even impossible to be classified based on the information currently available but certainly belong to different taxa (KERNDORFF & PASCHE 2004). In the course of our investigation we also discovered several new taxa. Two of them have already been published in 2003 (KERNDORFF & PASCHE 2003). Another autumn-flowering taxon was recently found by Turkish botanists and will be named "*Crocus nerimaniae*". Whether this taxon will be classified as a new species or as a subspecies of *Crocus biflorus*, where it certainly belongs to, is not yet clear (Brian Mathew, personal communication).

It seems that south-west Anatolia is the current centre of diversity of *Crocus biflorus* sensu lato. This is supported by all the latest findings and by the discovery of two further *Crocus biflorus* taxa by us in spring 2003. A full account is given in this article. Including these two new taxa, the total number of subspecies recognised in south-west Anatolia is increased to eleven: *Crocus biflorus* subsp. *crewei* (HOOK. FIL.) B. MATHEW, subsp. *nubigena* (HERBERT) B. MATHEW, subsp. *isauricus* (SIEHE ex BOWLES) B. MATHEW, subsp. *punctatus* B. MATHEW, subsp. *tauri* (MAW) B. MATHEW, subsp. *atrosperrmus* KERNDORFF & PASCHE, subsp. *leucostylosus* KERNDORFF & PASCHE, subsp. *ionopharynx* KERNDORFF & PASCHE, subsp. *caricus* KERNDORFF & PASCHE and the two autumn-flowering subspecies *wattiorum* B. MATHEW and *nerimaniae* (not yet published).

***Crocus biflorus* subsp. *ionopharynx* KERNDORFF & PASCHE, subsp. nova**

H o l o t y p u s : Turkey, Caria, Province Muğla, Batı Menteşi dağları, 800-1200 m, 14.3.2003, HKEP 0306 (LI).

Subspecies *pulchricolori* affinis sed cum zona distincta ianthina infra faucem luteam, filamenta longiora (7 mm), antherae nigrae, tunicae coriaceae et cataphylla alba.

Corm globose, about 10-15 mm in diameter. Tunics coriaceous, dark brown with rings at the base. Neck short, ≤ 3 mm. Cataphylls 3-4, silvery white. Leaves equal or longer than flowers at anthesis, 3-6 but normally 4, green, 1(-1,5) mm in diameter, glabrous, 2 ribs underneath. White stripe normal, width approximately 1/3 of leaf diameter. Throat yellow, becoming violet towards the bases of the filaments, papillous-densely papillous. Perianth tube whitish, more or less violet towards the apex. Outer segments between 19 and 29 mm but usually 22 mm long, between 6 and 11, frequently 8 mm wide. Inside all segments are blue-violet without markings, outside also blue-violet, rarely with specklings or featherings but with a distinct dark violet blotch towards the perianth tube. Inner segments between 15 and 25 mm but usually 20 mm long and between 6 and 12 mm but normally 9 mm wide, colouring and marking similar to outer segments but violet blotch much smaller. Prophyll absent. Bract and bracteole present, silvery white, conspicuous. Filaments 5 to 9 mm but normally 7 mm long, yellow, becoming violet towards the bases, papillous, densely at bases; anthers 5 to 10 mm, normally 7 mm long, greyish or black; connective sometimes yellow or colourless at the bases but always black towards the apex. Pollen yellow. The style is orange, yellowish at the base, divided into 3 branches, which are trumpet-shaped and fringed towards the end, branches scabrid-papillous. The styles are mostly as long as (59%) or longer than (41%) the stamens. Capsule and seeds not seen. Chromosome number unknown.

In overall appearance similar to subsp. *pulchricolor* (HERBERT) B. MATHEW. However, most distinct are the unusual long filaments (equal to anthers) which turn from yellow at the apex to violet at the base. An additional distinctive character is the violet-coloured zone in the throat around the basis of the filaments (Fig. 1a). Both features create a kind of small second violet throat between the yellow one and the perianth tube, which is only scarcely visible in the open flower. It can be seen on Fig. 1c as a small dark blotch in the centre of the flower. This is comparable to a typical character of *Crocus pestalozzae* BOISS., which has blackish stains at the base of the filaments. This character is also scarcely visible in the open flower and is mentioned by E. A. Bowles as "tiny pellets of soil fallen into the throat of the flower" (BOWLES 1952).

D i s t r i b u t i o n a n d h a b i t a t : Turkey, Caria, Muğla Province, very local, in open forests, mountain slopes, together with *Pinus brutia*, *Cistus creticus*, *Quercus coccifera*, *Pteridium aquilinum*, *Lavandula stoechas*, *Scilla bifolia*, *Romulea linaresii* subsp. *graeca*, *Crataegus monogyna*, *Cyclamen mirabile*, *Alkanna*, *Draba*, *Erodium* etc. Known from two localities in the Batı Menteşi dağları. The interesting fact that this crocus is found in Caria is a further proof for the immense variability of *Crocus biflorus* in SW Anatolia.

Specimens of subsp. *ionopharynx* are comparatively uniform in their appearances. A typical specimen is presented in Fig. 1b. Distinct striping and feathering on the outside of the outer segments could be observed in a few specimens only. The open flowers are slightly similar to those of subsp. *pulchricolor*. Populations of subsp. *ionopharynx* are easily distinguished from subsp. *pulchricolor*, e.g., by the coriaceous corm tunics, white

cataphylls, broader leaves with two ribs underneath (in *ssp pulchricolor* only 0-1), longer filaments, shorter and greyish to black anthers, and the styles being always longer or as long as the stamens. Most distinctive, however, is the unusually violet basis of the filaments and adjacent areas in the throat (hence the Greek name *ionopharynx*, meaning *ion* = violet and *pharynx* = throat).

The new subspecies seems to be growing only in non-calcareous soils. This is, in general, not very frequent within the *Crocus biflorus* aggregate and the genus as a whole. Regarding culture conditions it can be assumed that it will not be an “easy-to-grow” plant, but experiences are not yet available.

***Crocus biflorus* subsp. *caricus* KERNDORFF & PASCHE, subsp. nova**

H o l o t y p u s : Turkey, Caria, Province Muğla, Batı Menteşi dağları, 900-1200 m, 14.3.2003, HKEP 0307 (LI).

Subsp. *crewei* affinis sed cum tunica coriacea in fibres numerosas parallelas fissa, folia numerosa et angustiora, perigonum segmentis basi macula aenea notatis et filamenta longa brunnea-violacea.

Corm subglobose, approximately 1 cm in diameter. Tunics brown, coriaceous, splitting into coarse parallel stripes, with rings at the base and a short neck (5 mm). Cataphylls 3-4, silvery to light brown or yellowish. Leaves longer than flowers at anthesis, 2-7 but mostly 4 or 5, dark green, 1-1,5 mm in diameter, glabrous, with 0, 1 or 2 ribs underneath. White stripe normal, width approximately 1/3 of leaf-diameter. Throat bronze-brown with yellow or conspicuously dark red-brown edges, scabrid. Perianth tube mostly dark brown-violet, rarely whitish. Outer segments 17-28 mm, but normally 22 mm long and 5-10 mm, usually 7 mm wide. Inside of outer segments white, outside also white but significantly feathered, veined or speckled. Inner segments 17-26 mm, but usually 21 mm long, 5-9 mm, normally 8 mm wide. Inside and outside white without veining or markings. Prophyll absent. Bract and bracteole present, silvery white, membranous, conspicuous. Filaments 7-12 mm but usually 9 mm long, dark violet-brown, scarcely scabrid to (densely) papillous; anthers 6-12 mm normally 9 mm long, black with a black connective. Pollen yellow. The style is divided into 3 branches, branches often distinctly bent outwards, mostly filiform without significant fringes or broadenings at the end, yellow to orange, branches scabrid-papillous. Style always shorter or equal to stamen. Capsule and seeds not seen. Chromosome number unknown.

Similar to subsp. *crewei* but different by more and smaller leaves, distinct bronze-brown blotches on the yellow throat (Fig. 2a) or a throat which turns from yellow at the apex to dark red-brown towards the perianth tube and exceptionally long brown-violet filaments (Fig. 2b).

D i s t r i b u t i o n a n d h a b i t a t : Turkey, Caria, Province Muğla, locally abundant, at the edges of pine forests (*Pinus brutia* and *P. pallasiana*), together with *Quercus coccifera*, *Draba*, *Pteridium aquilinum*, *Bellis perennis*, *Anthemis*, *Veronica*, *Erodium*, etc. Sometimes between or under *Castanea sativa* together with *Cyclamen mirabile*, *Corydalis*, etc. Known from several places in different mountains in Caria. Because of its wider distribution in Caria we named it “*caricus*”. *Crocus biflorus* subsp. *caricus* is a very conspicuous new member of the *biflorus* aggregate and immediately recognisable by its always brown to bronze-coloured or tinged throat and extraordinary

long filaments of dark brown-violet colour. The populations investigated on different mountains are slightly different in their overall appearances (typical specimens are seen in Fig. 2c). Culture conditions are not available for the time being. *Crocus biflorus* subsp. *caricus* grows on both non-calcareous and calcareous rocks.

From the scientific point of view, the discoveries of *Crocus biflorus* subsp. *ionopharynx* and subsp. *caricus* are most interesting. Once more the high variability within and among populations as well as between different taxa of the *C. biflorus* aggregate in south-west Anatolia is revealed. All kinds of characters existing in the genus and new combinations thereof can be observed. The understanding of the relationship and the distribution within this aggregate improves by filling up the gaps in this complex mosaic, whereas the (artificial) borders of the system become blurred.

Acknowledgements

Thanks go to our families for their tolerance, financial support, and understanding of our work.

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Figure 1. *Crocus biflorus* subsp. *ionopharynx*. a) detail of the throat, b) typical outside appearance of the flowers, c) habit at type locality.



Figure 2. *Crocus biflorus* subsp. *caricus*. a), b) details of the throat, c) habit at type locality.